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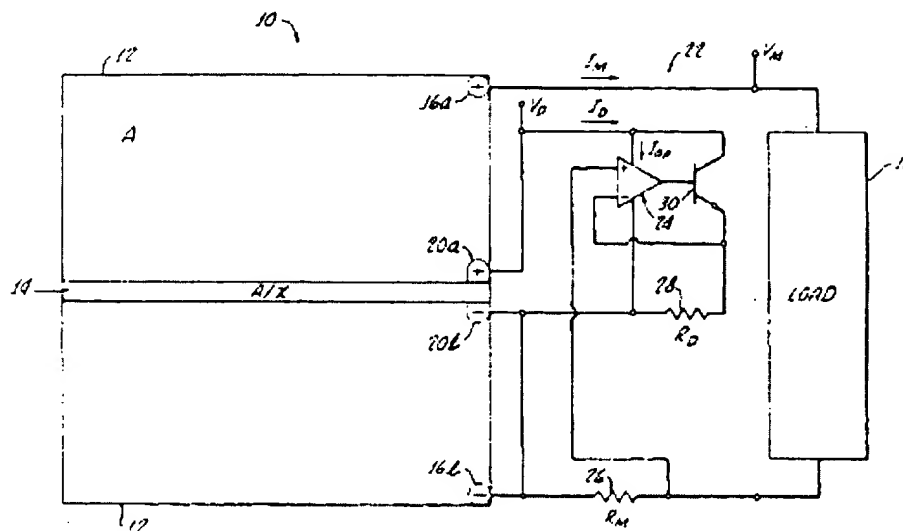


Fig. 1.

Family Lookup

EP0997742

State-of-charge-measurable batteries

Hewlett-Packard Company

Inventor(s): ;Owen, Geraint ;Myers, Timothy F.

Application No. EP99308486 , Filed 19991027 , A2 Published 20000503 ,

**Abstract:**

A storage device (10) allows the state of charge of a main battery (12) to be determined by measuring the state of charge of a dummy battery (14). The storage device (10) may provide power to an electronic appliance such as a portable computer (11). The main and dummy batteries (12 and 14) each have a storage capacity and a self-discharge rate. The storage capacity of the dummy battery (14) is less than the storage capacity of the main battery (12); for example, the storage capacity of the dummy battery (14) may be only about 1% of that of the main battery (12). The main and dummy batteries (12 and 14) are configured so that the self-discharge rates thereof are substantially equal. The storage device (10) also includes discharge circuitry (22) which is configured so that the dummy battery (14) discharges at a rate faster than the main battery (12) when a load is connected to and drawing current from the main battery (12).

Int'l Class: G01R03136

Priority: US 181797 19981028

**Designated States:** AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

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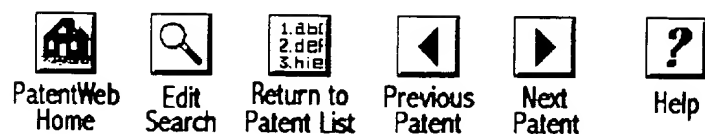


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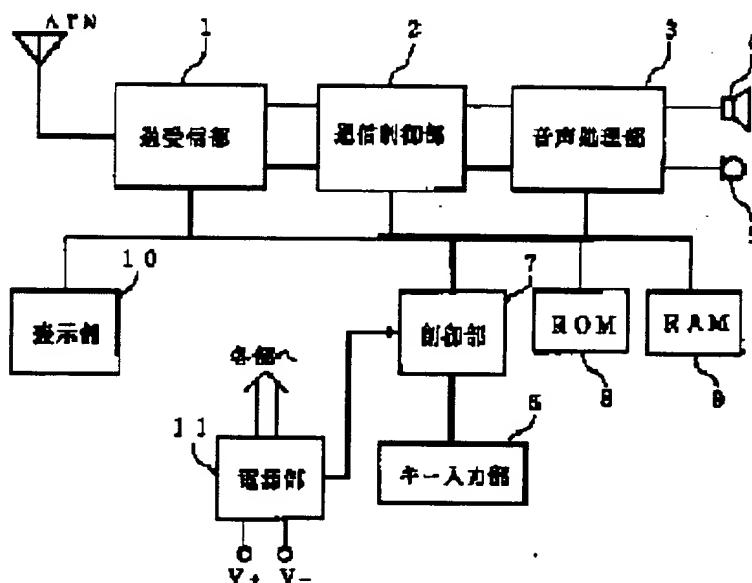
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Family Lookup

JP10032933

**BATTERY REMAINING CAPACITY DISPLAY DEVICE AND PORTABLE ELECTRONIC EQUIPMENT USING IT**  
CASIO COMPUT CO LTD

Inventor(s): AIHARA TOSHIHARU

Application No. 08184373 , Filed 19960715 , Published 19980203

## Abstract:

PROBLEM TO BE SOLVED: To provide a battery remaining capacity display device for matching a

remaining capacity being displayed to a remaining capacity on actual operation immediately after charging and a portable electronic equipment using the device.

SOLUTION: A control part 7 clocks the charge time of a secondary battery by an internal timer when charging the secondary battery, calculates the number of cells to be increased for a display cell being indicated on a display part 10 immediately before charging based on a clocked charge time after charging is completed, and the number of cells is added to the number of display cells immediately before charging as the number of display cells immediately after charging. The control part 7 turns on the display cell of the display part 10 by the calculated number of display cells after charging.

**Int'l Class:** H02J00700 H01M01048 H02J00710 H04B00726

**MicroPatent Reference Number:** 000065991

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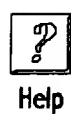


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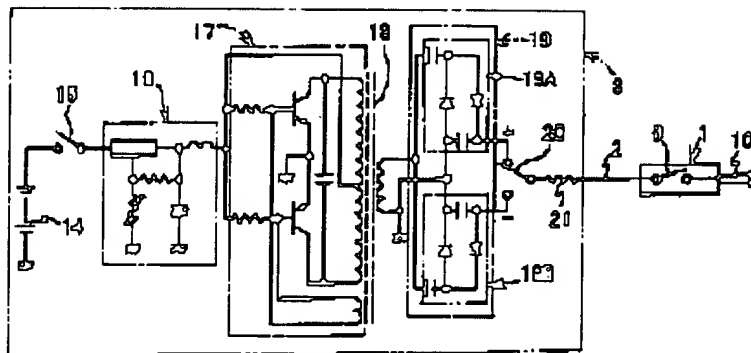
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JP10189283

PORTABLE CHARGING UNIT

KASUGA ELECTRIC WORKS LTD

Inventor(s) ; TAGUCHI YOSHINARI ; UEHASHI KATSUYUKI

Application No. 08345953 , Filed 19961225 , Published 19980721

**Abstract:**

PROBLEM TO BE SOLVED: To charge a lead terminal of a semiconductor with spark discharge between a charging unit and the lead terminal avoided as much as possible by arranging a voltage

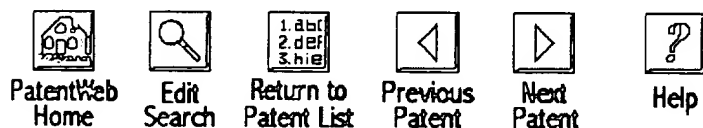
applying on- off switch connected to a polarity switching switch formed in a main body and a metal probe in a pen type voltage applying operation unit connected to the main body with a cord.

SOLUTION: A battery 14, a power source on-off switch 15, a power source voltage control part 16, a high frequency oscillation circuit 17, a high frequency step-up transformer 18, and a polarity switching switch 20 which switches plus- minus DC high voltage from a high frequency output and outputs are arranged in a main body 3. The polarity switching switch 20 is connected to a voltage applying on-off switch 6 of a voltage applying operation unit 1 through a current regulating resistance 21 and a cord 2. The voltage on-off switch 6 and a metal probe 10 are electrically connected. Charges are given to only one desirable lead terminal of many lead terminals so as to become a desirable charging condition.

**Int'l Class:** H05F00304

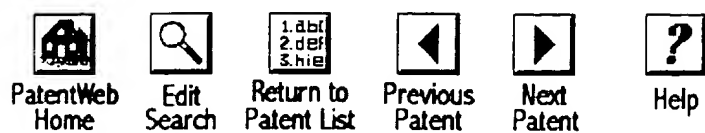
**MicroPatent Reference Number:** 000189191

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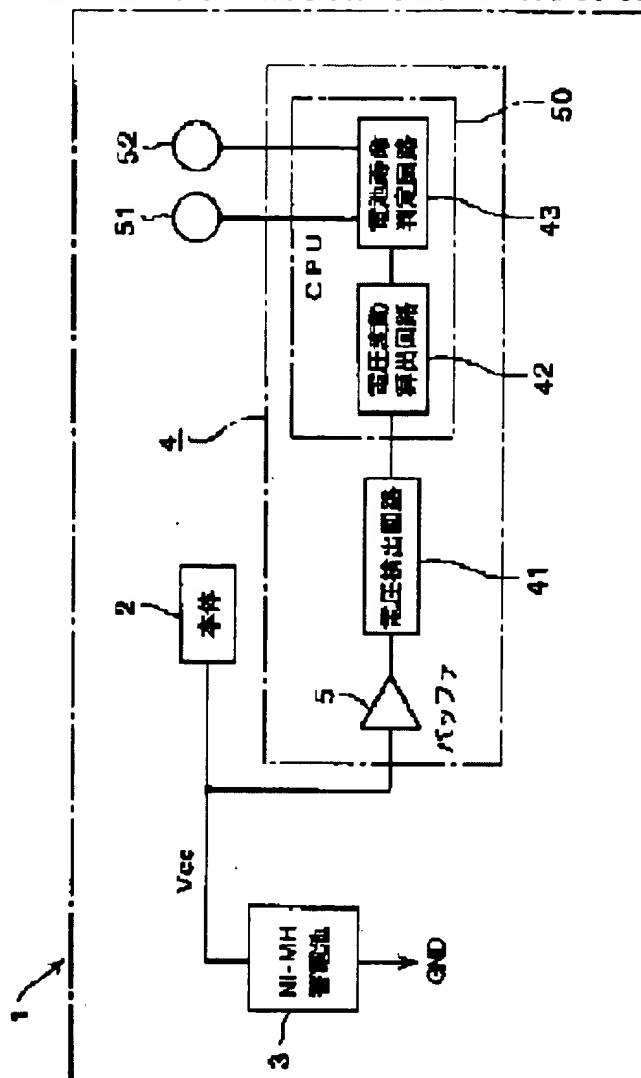
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Family Lookup

JP2000206214

BATTERY LIFE DETECTING DEVICE

MITSUTOYO CORP

Inventor(s): ;YASUDA MAMORU ;KUWAJIMA MAMORU ;OKAWA TAKESHI ;ISHIBASHI KAZUNARI

Application No. 11009342 , Filed 19990118 , Published 20000728

### Abstract:

PROBLEM TO BE SOLVED: To provide a battery life detecting device capable of predicting the

battery life of a secondary battery.

SOLUTION: A battery life detecting device 4 is provided with a voltage detecting circuit 41 which detects a voltage Vcc outputted from a secondary battery 3 every specified period, a voltage change calculating circuit 42 which calculates a voltage change value on the basis of a voltage of a secondary battery 3 which voltage is inputted to the voltage detecting circuit 41, and a battery life judging circuit 43 which judges the battery life on the basis of the voltage change value obtained by the voltage change calculating circuit 42. While a portable measuring apparatus 1 is used, the voltage Vcc which is supplied from the secondary battery 3 to a main body 2 is watched, and a charge and a discharge states of the secondary battery 3 are successively confirmed. As a result, the battery life of the secondary battery 3 can be predicted.

**Int'l Class:** G01R03136 H01M01048

**MicroPatent Reference Number:** 001563727

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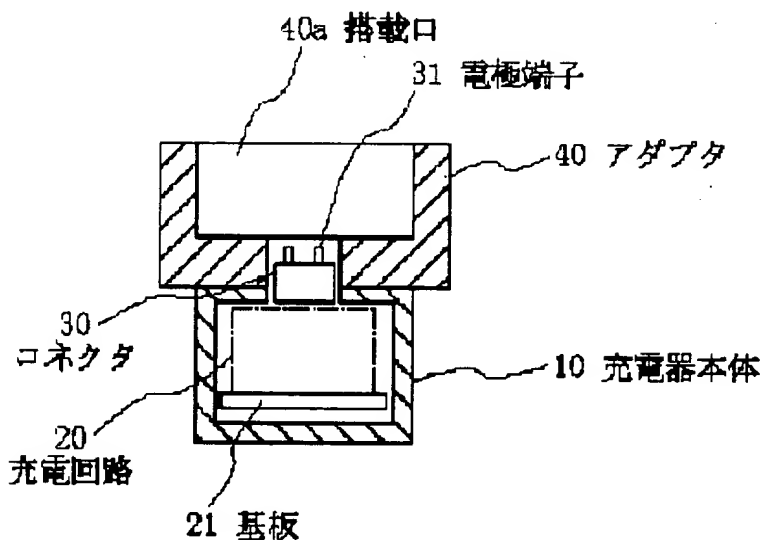
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JP2000188833

CHARGER OF PORTABLE INFORMATION TERMINAL AND CHARGING SYSTEM  
USING THE SAME  
NEC SHIZUOKA LTD

Inventor(s): ;SUZUKI OSAMU

Application No. 10364764 , Filed 19981222 , Published 20000704

### Abstract:

PROBLEM TO BE SOLVED: To enable charging a battery having a different form, without

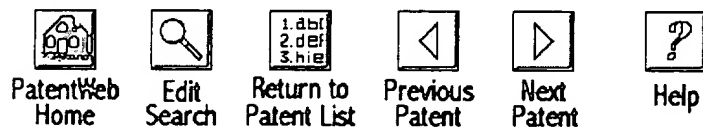
changing a charger body, when a different kind of portable information terminal is used.

**SOLUTION:** A charger is divided and constituted of a charger body 10 and an adapter 40. The adapter 40 has a form, wherein the inner form of a mounting port 40a conforms to the outer form of a corresponding battery and can hold it. A battery side connector has a hole to be connected with a connector 30 of the charger body 10, and is connected detachably on the upper surface of the charger body 10. Since the charger main body 10 and the adapter 40 can be divided, the charger body 10 can be applied commonly to a variety of portable information terminals. By changing the adapter for holding the battery, the charger is made capable of coping with batteries having the variety of portable information terminals.

**Int'l Class:** H02J00700 H01M01046

**MicroPatent Reference Number:** 001546359

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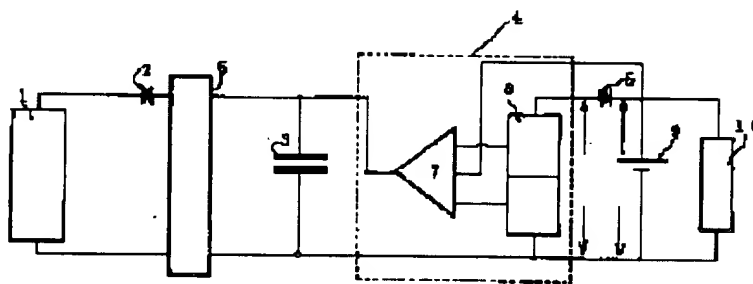


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☐ Include in patent order**MicroPatent® Worldwide PatSearch:** Record 283 of 705**Family Lookup****JP09215224****PORTABLE POWER SUPPLY UNIT WITH BATTERY CHARGER****YAMAMOTO SHIGEO****Inventor(s): ;YAMAMOTO SHIGEO****Application No. 08015347 , Filed 19960131 , Published 19970815****Abstract:**

**PROBLEM TO BE SOLVED:** To improve largely the life of a secondary battery, by providing a next stage secondary battery which feeds a power to its subsequent load and is charged by the output of a

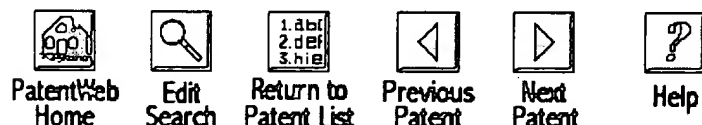
DC-DC converter for increasing the voltage of a secondary battery for charging to feed a power to the foregoing next stage.

SOLUTION: A DC-DC converter 4 is a DC-AC-DC conversion type one which operates even when the voltage of a secondary battery 3 for charging becomes lower than the voltage of a next stage battery 9, and feeds a power to the next stage secondary battery 9 via a diode 5 both for preventing a reverse current and for controlling a voltage. Further, in the case of using the voltage of a constant-voltage secondary battery 3 as a reference voltage, when the output voltage of a comparison circuit 7 is higher than the reference voltage, after the output voltage is converted into an AC voltage via a chopper circuit, the AC voltage is lowered to the charging voltage of the ordinary secondary battery 9 by a step-down circuit to charge the battery 9 via the voltage controlling diode 5. Also, when being lower than the reference voltage, the AC voltage is increased to the charging voltage of the ordinary secondary battery 9 by a step-up circuit to charge the battery 9. As a result, a battery charging power supply capable of a long-time charging is obtained.

**Int'l Class:** H02J00735 H01G009155 H01L03104 H01M01046 H02N00600

**MicroPatent Reference Number:** 000791926

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Family Lookup

JP08237939

POWER SUPPLY PARTICULARLY FOR PORTABLE DEVICE

ALCATEL ALSTHOM CO GENERAL ELECTRICITE

Inventor(s): ;ANDRIEU XAVIER ;POIGNANT PHILIPPE

Application No. 07332072 , Filed 19951220 , Published 19960913

**Abstract:**

**PROBLEM TO BE SOLVED:** To obtain a power supply circuit suitable to supply large electric power with superior energy efficiency by causing a converter to charge a super- capacitor with a constant current and monitoring a voltage across terminals.

**SOLUTION:** A circuit 1 is provided with an electro-chemical battery 10, a voltage converter coupled with the terminals of the battery and a super- capacitor 12 for feeding power to an external device 2. When the external device 2 consumes power, a terminal voltage  $U_s$  of the super- capacitor 12 is discharged down to the value under the first threshold value and a function area F2 turns a converter on via the functional area F1, depending on detection of the voltage having exceeded the such threshold. Next, the converter receives the power from the battery 10 and continues charging of the super-capacitor 12, until the terminal voltage  $U_s$  reaches the second threshold value with a constant current  $I_s$  controlled by the change of application efficiency, and the converter is turned off, depending on detection of the voltage having exceeded the threshold. As a result, the power supply circuit which is suitable for supplying large power with high efficiency can be obtained.

**Int'l Class:** H02M003155 H04B00726**Priority:** FR 94 9415335 19941220**MicroPatent Reference Number:** 001540334

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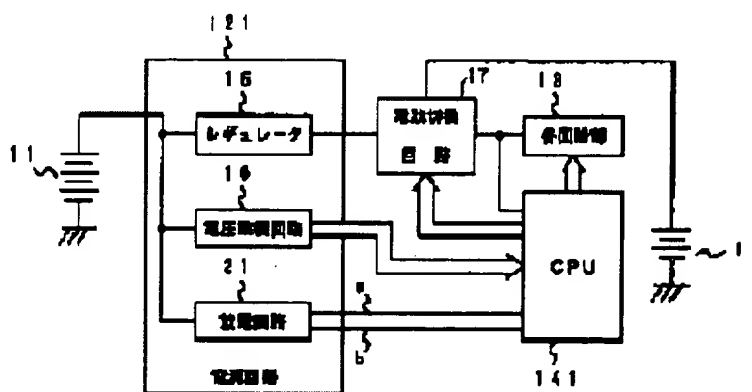
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JP08242546

POWER SOURCE CIRCUIT FOR PORTABLE EQUIPMENT

CASIO COMPUT CO LTD

Inventor(s): ;TAKANO SHINJI

Application No. 07044306 , Filed 19950303 , Published 19960917

### Abstract:

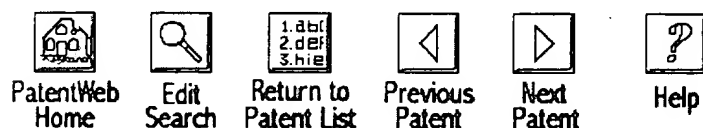
PURPOSE: To charge the secondary battery of a power source in a short time without causing any memory effect.

CONSTITUTION: A power source circuit for portable equipment is provided with a secondary battery 11, backup battery 18 which backs up the power supply instead of the battery 11, discharge circuit 21 which causes the battery 11 to discharge, voltage monitoring circuit 16 which detects that the voltage generated by the battery 11 becomes lower than a prescribed value, and a CPU 141 which switches the power supply from the secondary battery 11 to the backup battery 18 when the circuit 16 detects that the voltage generated by the battery 11 becomes lower than the prescribed value and causes the battery 11 to discharge for a fixed period of time.

**Int'l Class:** H02J00704 H02J00700 H02J00700

**MicroPatent Reference Number:** 001060871

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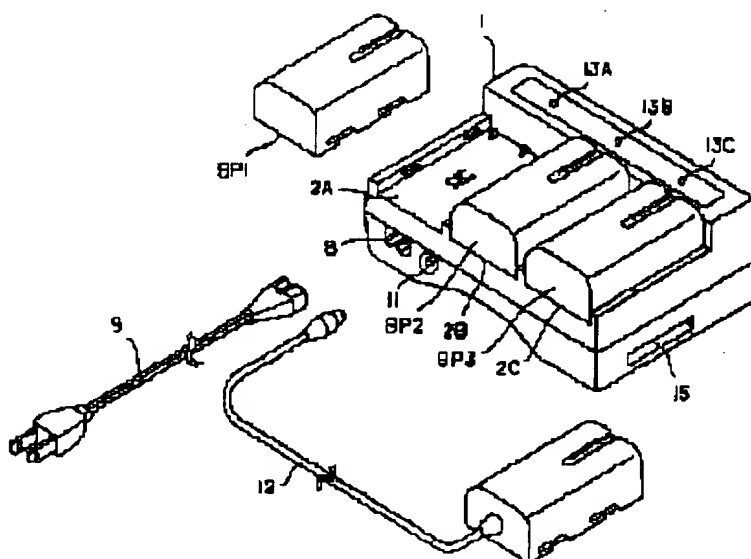
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JP08227732

POWER SOURCE DEVICE

SANYO ELECTRIC CO LTD

Inventor(s): MORITA HIDEYO ;MINO TAKAYUKI

Application No. 07031048 , Filed 19950220 , Published 19960903

### Abstract:

PURPOSE: To minimize the attaching and detaching operation of a pack battery and improve the operability by installing a plurality of pack batteries provided with secondary batteries to the battery

installing part of a body case, and inputting a charging power to a charging circuit from a charging power input part.

CONSTITUTION: Battery installing parts 2A-2C for installing a plurality of pack batteries BP1-BP3 are formed on the surface side of a portable body case 1. A charging circuit 3 consisting of a power source part 4 for generating a required DC power, a charge control switch 5, change-over switches 6A-6C, and a microcomputer 7; and a discharge circuit 10 are built in the main body case 1. The main body case 1 also has a DC connector 11 for outputting the discharging power of the pack batteries BP1-BP3 installed to the battery installing parts 2A-2C to the outside through the discharge circuit 10.

**Int'l Class:** H01M01046 H01M00210 H01M01044

**MicroPatent Reference Number:** 001048124

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